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(71) Demandeur: FLEXICO-FRANCE
F-60119 Henonville (FR)

(72) Inventeur: Bolo, Henri
92200 Neuilly-Sur-Seine (FR)

(74) Mandataire: Tixier, Christian
Cabinet Regimbeau,
26, Avenue Kléber
75116 Paris (FR)

(54) Machine de formation, remplissage et fermeture automatique de sacs, à profilés de fermeture transversaux

(57) La présente invention concerne une machine de formation, d'emballage à base de film (F) comportant des profilés de fermeture complémentaires (P), caractérisée par le fait qu'elle comprend des moyens d'acheminement des profilés de fermeture, transversalement, sur le film (F), comprenant en combinaison : un guide rectiligne (100) superposé au film (F), transversalement à celui-ci, conçu pour positionner, avec précision au moins un profilé de fermeture (P), transversalement au-dessus du film (F), et un moyen (150) de préhension de l'extrémité amont du profilé de fermeture, susceptible de déplacement transversal, le long du guide (100), pour acheminer le profilé de fermeture (P) dans ce dernier par traction sur l'extrémité amont du profilé de fermeture.

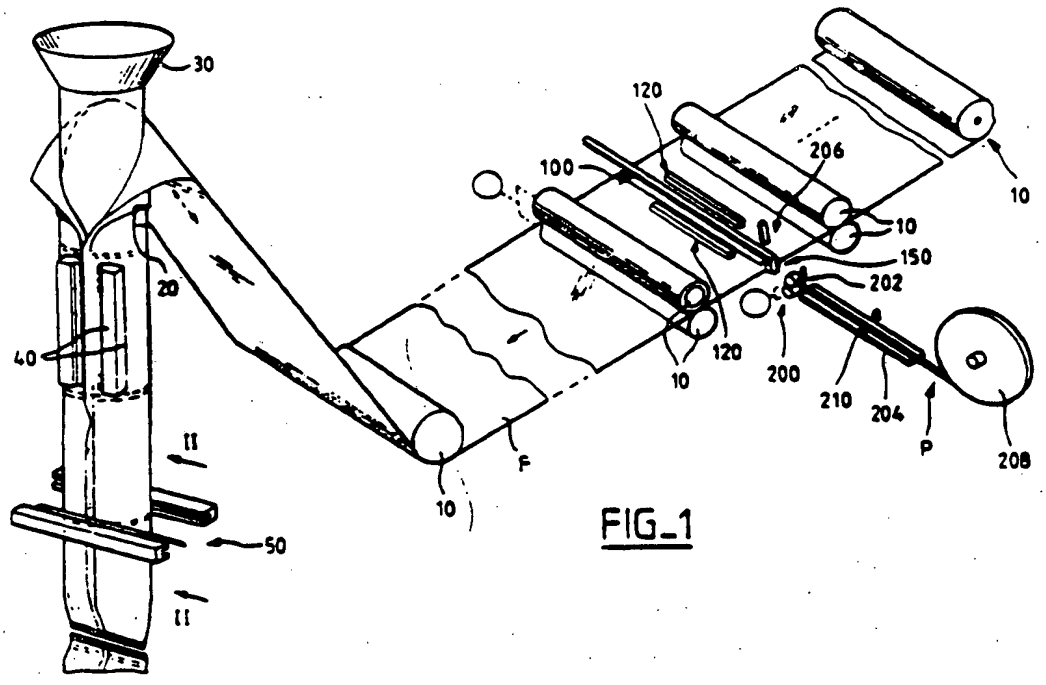

FIG_1

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transversalement les profilés sur un sabot superposé au film puis à abaisser celui-ci contre le film pour assurer la fixation des profilés de fermeture.

Après avoir constaté qu'aucune des techniques décrites dans les documents précités ne donne satisfaction, il a été proposé dans le document US-A-5111643 une démarche totalement différente, consistant non point à fixer les profilés de fermeture sur le film, avant d'acheminer celui-ci sur le col de formage comme décrit dans les documents précités, mais de conformer tout d'abord le film en tube, sur le tube de formage, puis d'acheminer ensuite les profilés de fermeture sur le film tubulaire. A cette fin, le document US-A-5111643 propose une installation complexe comprenant une goulotte qui débouche à la base du col de formage pour acheminer les profilés de fermeture portés par une bande support, et une goulotte d'évacuation pour la bande support.

La présente invention a maintenant pour but de perfectionner les machines de formation, d'emballages à base de film comportant des profilés de fermeture complémentaires.

Ce but est atteint, selon la présente invention grâce à une machine caractérisée en ce qu'elle comprend des moyens d'acheminement des profilés de fermeture, transversalement, sur le film, qui comprennent en combinaison :

- un guide rectiligne superposé au film, transversalement à celui-ci, conçu pour positionner avec précision au moins un profilé de fermeture, transversalement au-dessus du film, et
- un moyen de préhension de l'extrémité amont du profilé de fermeture, susceptible de déplacement transversal, le long du guide, pour acheminer le profilé de fermeture dans ce dernier par traction sur l'extrémité amont du profilé de fermeture.

L'invention s'applique de préférence aux machines de formation, remplissage et fermeture automatiques d'emballages à base de film, du type connu en soi comprenant un col de formage qui reçoit en entrée le film à l'état plan en provenance d'un dérouleur et fournit en sortie le film conformé en tube, une goulotte de remplissage qui débouche dans ce col de formage et par conséquent dans ledit tube, des moyens pour acheminer des profilés de fermeture transversalement sur le film avant que celui-ci n'atteigne le col de formage et pour fixer ceux-ci sur le film, des moyens de soudure longitudinale pour fermer le tube longitudinalement et des moyens aptes à générer séquentiellement une première soudure transversale avant qu'un produit ne soit introduit dans le tube par la goulotte de remplissage, puis une seconde soudure transversale quand le produit a été introduit dans le tube, pour fermer un emballage autour de ce dernier.

Ainsi, la présente invention va à l'encontre du préjugé lié aux moyens de mise en oeuvre décrits dans les premiers documents US-A-4617683 et US-A-4655862. En effet, alors que de nombreux concepteurs ont considéré que les moyens décrits dans ces documents ne pouvaient donner satisfaction, ce qui a entraîné les nombreuses propositions ultérieures rappelées ci-dessus, les présents inventeurs, après de nombreuses expérimentations ont constaté qu'une solution inspirée des moyens décrits dans ces documents US-A-4617683 et US-A-4655862, pouvaient donner satisfaction, sous réserve d'un perfectionnement consistant à combiner un guide rectiligne et un moyen de préhension opérant par traction sur les profilés de fermeture.

Selon une autre caractéristique avantageuse de l'invention, les moyens d'acheminement des profilés de fermeture sont adaptés pour fixer sur le film l'un de deux profilés complémentaires, en prise, possédant chacun une longueur de l'ordre de la moitié de la largeur du film, et il est prévu en outre des moyens aptes à fixer le second profilé de fermeture, sur la paroi interne du film conformé en sachet, après remplissage de celui-ci, au moment de la finition du sachet.

Pour faciliter ces opérations de fixation des profilés de fermeture en deux temps, de préférence les deux profilés de fermeture sont portés par des bandes support de largeur différente.

D'autres caractéristiques, buts et avantages de la présente invention apparaîtront à la lecture de la description détaillée qui va suivre, et en regard des dessins annexés donnés à titre d'exemple non limitatif et sur lesquels :

- la figure 1 représente une vue schématique en perspective d'une machine de formation remplissage et fermeture automatique de sacs conforme à la présente invention,
- les figures 2 et 3 illustrent schématiquement deux variantes de mise en oeuvre de l'invention,
- la figure 4 est une vue en coupe verticale de la machine selon la vue référencée II-II sur la figure 1,
- la figure 5 représente une vue latérale d'un sac conforme à la présente invention, et
- la figure 6 représente une vue en perspective d'un sac à soufflets conforme à la présente invention.

On retrouve sur la figure 1 annexée la structure générale classique d'une machine de formation, remplissage et fermeture automatique de sacs, à profilés de fermeture complémentaires, comprenant :

- des moyens 10 d'acheminement du film F,
- un col de formage 20,
- une goulotte de remplissage 30,
- des moyens 40 de soudure longitudinale, et
- des moyens 50 de soudure transversale et de séparation des sacs.

Cette structure générale étant connue, elle ne sera pas décrite plus en détail par la suite.

du film F De préférence, les soudures longitudinales 84 en "porte manteau" sont symétriques par rapport à un plan médian du sachet transversal aux soudures 82, 86 et réalisées à l'aide de mâchoir s de soudure de formes complémentaires,

- la possibilité de réaliser des sachets à soufflets latéraux 90, 92, comme schématisé sur la figure 6, grâce à la réalisation de plis longitudinaux sur le film F avant l'entrée sur le col de formage 20.

Sur la figure 4, on a schématisé en 51 un outil de coupe associé aux mâchoires de soudure transversale 50 pour séparer les sachets une fois terminés, et on a schématisé en 53 un outil de coupe susceptible d'être utilisé pour réaliser la ligne de prédécoupe 80.

Les profilés de fermeture P eux-mêmes peuvent faire l'objet de nombreuses variantes.

Comme cela est schématisé sur la figure 2, il peut s'agir de profilés male/femelle dissymétriques complémentaires P1 et P2.

Il peut s'agir également comme schématisé sur la figure 3 de profilés P de section constante aptes à venir en prise après repliement sur eux-mêmes.

De préférence, il est prévu des moyens, par exemple sous forme de profilés P bi-matière ou moyens équivalents, permettant de définir une température de fusion sur la surface extérieure des bandes support 54, 56 inférieure à la température de fusion sur leurs surfaces internes.

Le film F utilisé peut également faire l'objet de nombreuses variantes. Il peut s'agir d'un film souple en matière plastique monocouche ou multicouche, le cas échéant revêtu, par exemple métallisé.

La présente invention offre de nombreux avantages par rapport aux systèmes existant antérieurement et, parmi lesquels on peut citer les suivants :

- le dépôt des profilés de fermeture P par traction, et sur un guide 100 permet un positionnement très précis sur la largeur du film F et à l'état rectiligne,
- une grande facilité de mise en oeuvre, et
- une bonne étanchéité (des profilés de fermeture s'étendent parallèlement aux moyens de soudure transversale 50 et ne perturbent pas le fonctionnement de ceux-ci).

Bien entendu la présente invention n'est pas limitée aux modes de réalisation particuliers qui viennent d'être décrits, mais s'étend à toute variante conforme à son esprit.

Ainsi, on a décrit précédemment l'application de l'invention à des machines automatiques de formation, remplissage et fermeture d'emballages à base de film.

Cependant, on peut aussi appliquer l'invention à des machines de préparation de films équipés de profilés, lesquels films équipés de profilés sont ensuite acheminés pour approvisionner des machines de formation, remplissage et fermeture automatiques d'emballages classiques en elles-mêmes.

On a décrit précédemment des moyens de préhension formés soit d'un système de pince, soit d'une tête aspirante. Selon une autre variante, les moyens de préhension peuvent être formés d'une aiguille portée par des moyens d'entraînement adaptés pour, d'un part déplacer alternativement l'aiguille, par translation ou pivotement, en rapprochement et en éloignement du guide 100, pour piquer le profilé P dans la position rapprochée du guide et d'autre part déplacer alternativement l'aiguille en va et vient le long du guide 100. Plus précisément, ces moyens d'entraînement sont adaptés pour 1) rapprocher l'aiguille de l'extrémité amont du guide 100 pour piquer l'extrémité libre du profilé P provenant de la réserve 208, 2) déplacer l'aiguille le long du guide 100 en maintenant l'aiguille en position rapprochée en prise avec le profilé pour acheminer celui-ci par traction sur son extrémité amont, 3) déplacer l'aiguille en éloignement du guide 100 pour libérer le profilé P à la fin de la course d'acheminement, et 4) déplacer en retour l'aiguille le long du guide 100 vers l'extrémité amont de celui-ci en maintenant l'aiguille en position éloignée libre par rapport au profilé, avant de réitérer un cycle d'entraînement à partir de l'étape 1) pour le tronçon suivant de profilé P.

Revendications

1. Machine de formation d'emballage à base de film (F) comportant des profilés de fermeture complémentaires (P), caractérisée par le fait qu'elle comprend des moyens d'acheminement des profilés de fermeture, transversalement, sur le film (F) qui comprennent en combinaison :

   - un guide rectiligne (100) superposé au film (F), transversalement à celui-ci, conçu pour positionner avec précision au moins un profilé de fermeture (P), transversalement au-dessus du film (F), et
   - un moyen (150) de préhension de l'extrémité amont du profilé de fermeture, susceptible de déplacement transversal, le long du guide (100), pour acheminer le profilé de fermeture (P) dans ce dernier par traction sur l'extrémité amont du profilé de fermeture.

2. Machine selon la revendication 1, caractérisée par le fait que la machine de formation constitue une machine de formation, remplissage et fermeture automatique d'emballage, comprenant un col de formage (20) qui reçoit en entrée le film à l'état plan en provenance d'un dérouleur et fournit en sortie le film (F) conformé en tube, une goulotte de remplissage (30) qui débouche dans ce col de formage (20) et par conséquent dans ledit tube, des moyens (200, 202, 204) pour acheminer des profilés de fer-

19. Machine selon l'une des revendications 1 à 18, caractérisée par le fait qu'elle comprend des moyens aptes à acheminer des profilés de fermetur (P) male/femelle dissymétriques complémentaires.

20. Machine selon l'une des revendications 1 à 18, caractérisée par l fait qu'elle comprend des moyens (208) aptes à acheminer un profilé (P) de section constante apte à venir en prise après repliement sur lui-même.

21. Machine selon l'une des revendications 1 à 20, caractérisée par le fait que les profilés (P) sont adaptés pour définir une température de fusion, sur la surface extérieure de leurs bandes support (54, 56), inférieure à la température de fusion sur la surface interne de celles-ci.

22. Emballage obtenu par la mise en oeuvre d'une machine conforme à l'une des revendications 1 à 21.

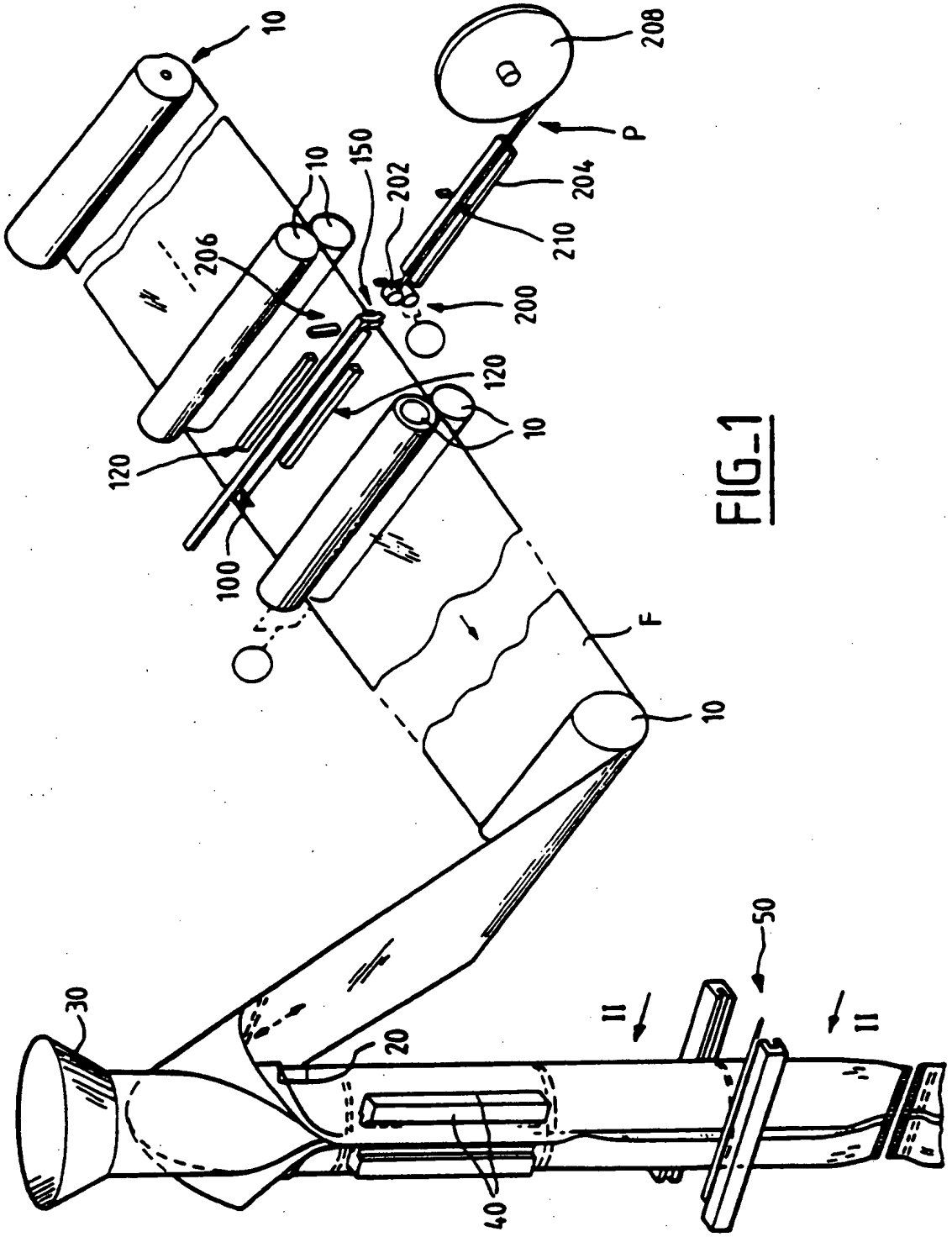
10
208
P
150
202
204
210
206
200
120
10
120
100
F
10
50
30
II
II
20
40

FIG_1

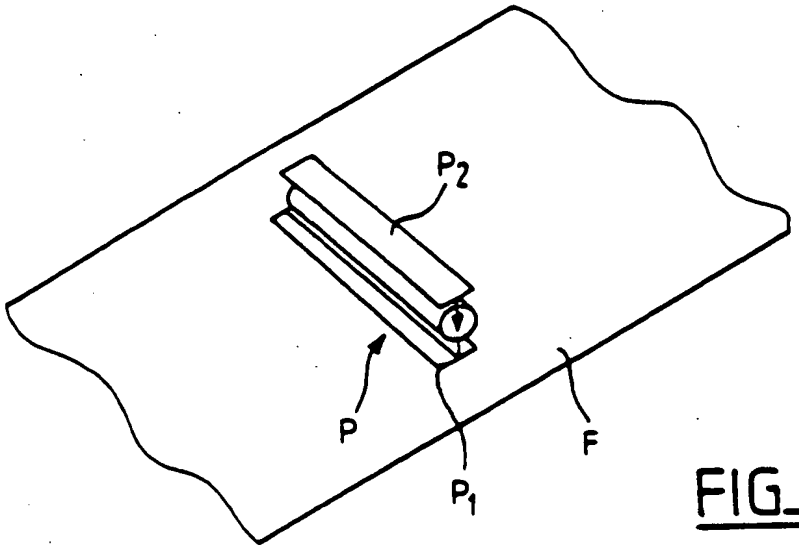

FIG_2

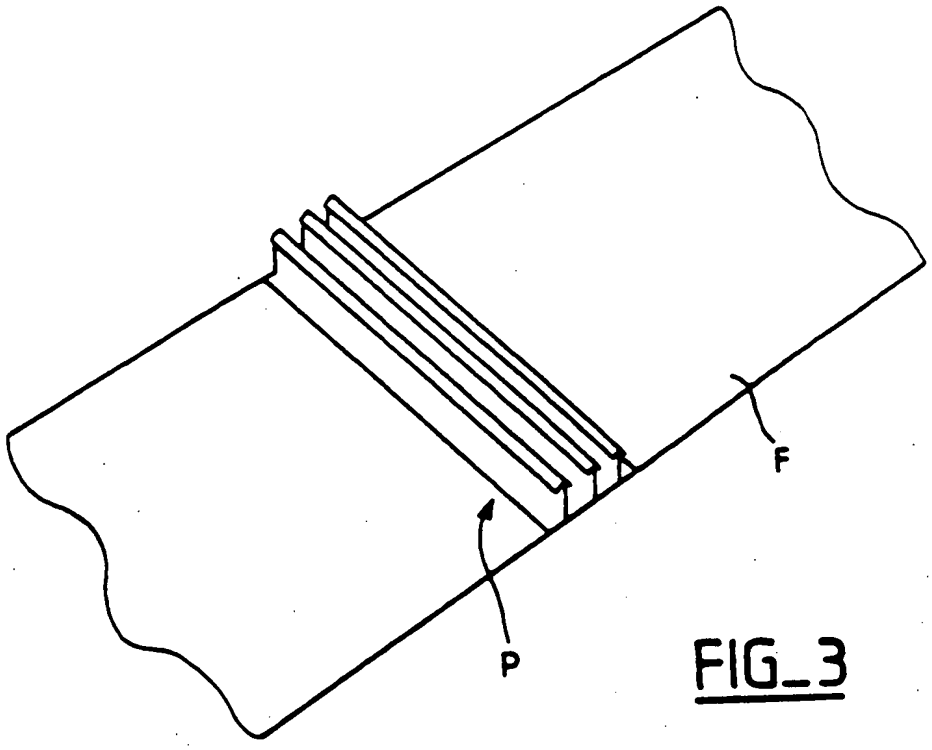

FIG_3

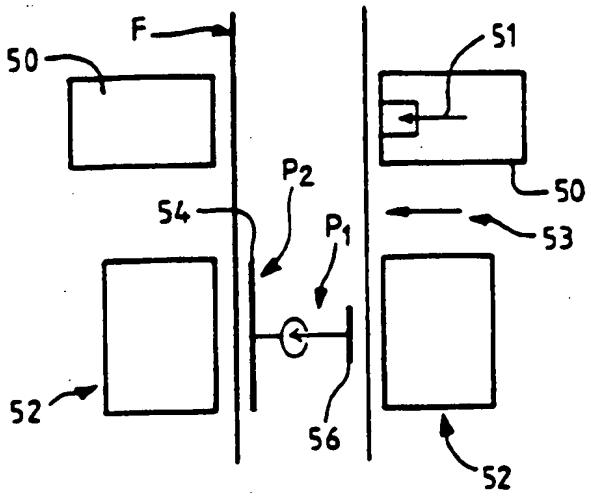

FIG_4

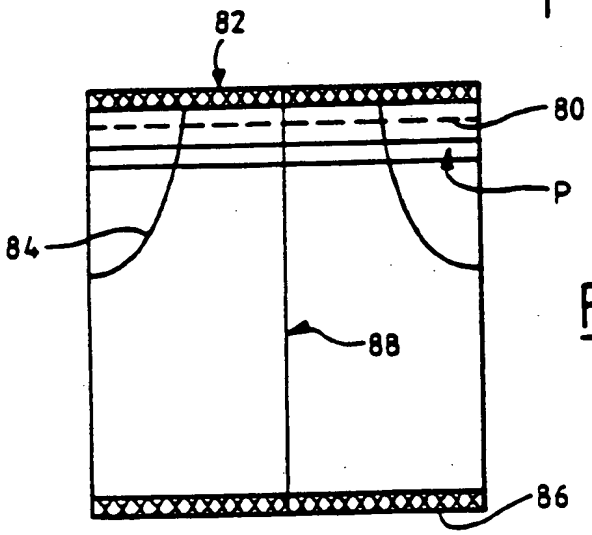

FIG_5

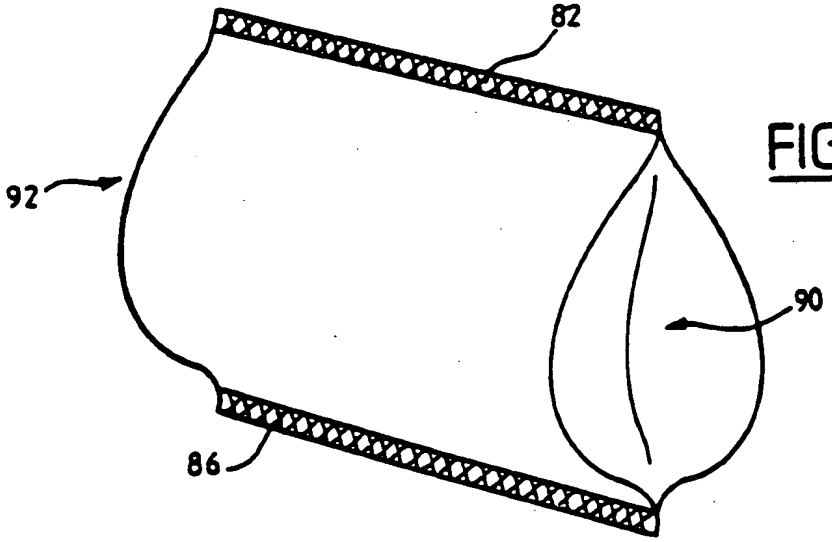

FIG_6

Office européen des brevets

RAPPORT DE RECHERCHE EUROPEENNE

Numéro de la demande
EP 97 40 0408

DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie	Citation du document avec indication, en cas de besoin, des parties pertinentes	Revendication concernée	CLASSEMENT DE LA DEMANDE (Int.Cl.6)
X	US 4 909 017 A (M. MCMAHON) * colonne 3, ligne 11 - colonne 4, ligne 39; figures *	1-4,8, 13-15, 19,22	B6589/20
Y		18	
X	US 4 709 398 A (S. AUSNIT) * colonne 2, ligne 20 - colonne 3, ligne 58; figures *	1,3,10, 13-16, 19,20,22	
D,X	US 4 617 683 A (P. CHRISTOFF) * colonne 6, ligne 45 - colonne 8, ligne 60; figures *	1-3,7, 11, 13-15, 17,19,22	
Y	US 3 838 549 A (C. PEPMEIER) * colonne 5, ligne 26 - colonne 6, ligne 45; figures *	18	

DOMAINES TECHNIQUES RECHERCHES (Int.Cl.6)

B65B
B31B

Le présent rapport a été établi pour toutes les revendications

Lieu de la recherche	Date d'achèvement de la recherche	Examinateur
LA HAYE	3 Juin 1997	Jagusiak, A

CATEGORIE DES DOCUMENTS CITES

X : particulièrement pertinent à lui seul
Y : particulièrement pertinent en combinaison avec un autre document de la même catégorie
A : arrière-plan technologique
O : divulgation non-écrite
P : document intercalaire

T : théorie ou principe à la base de l'invention
E : document de brevet antérieur, mais publié à la date de dépôt ou après cette date
D : cité dans la demande
L : cité pour d'autres raisons

& : membre de la même famille, document correspondant

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TRANSLATION

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Inventor: Henri Bois, France
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Contracting countries: Austria, Belgium, Switzerland, Germany, Denmark, Spain, France, Great Britain, Italy, Liechtenstein, Portugal.

Machine for the automatic forming, filling and closing of bags or pouches, with cross closure profiles.

57 - The present invention relates to a machine for the forming of film-based (F) packaging comprising complementary closure profiles (P), characterized in that it comprises means for the forward displacement (acheminement) of the closure profiles, transversely on the film (F), comprising, in combination: a rectilinear guide (100) superposed to the film (F), in the direction transverse to that of the film, designed to position with precision at least one closure profile (P), transversely above the film (F), and a means (150) for the prehension of the upstream end of the closure profile, capable of transverse displacement, along the guide (100), to move forward the closure profile (P) in the latter guide by traction on the upstream end of the closure profile.

Sp cificati n

The present invention relates to the field of bags or pouches that comprise complementary closure profiles adapted to permit successive openings and closings the user, at will.

More precisely, the present invention relates to the field of machines to that end, especially of those machines adapted for the automatic forming, filling and closing of packagings based on film, especially on thermoplastic material, comprising complementary closure profiles, for example male and female complementary closure profiles.

Such machines are often called FFS, this corresponding to the initial of the English expression "Form, Fill and Seal Machine".

Numerous machines of this type have already been suggested (see for example the documents EP-A-528721 and US-A-4894975).

Most of these machines comprise a forming neck that, at their intake point, receive film in the flat state that comes from a de-winding device and that, at the their exit, supply the film shaped as a tube; a filling chute that opens into this forming neck and consequently into this tube; means to move forward closure profiles and to affix same onto the film, longitudinal welding means to close the tube longitudinally; and means suitable to generate in sequence a first transverse welding before a product is introduced into the tube through the filling chute, then a second transverse welding after the product has been introduced into the tube, to close a packaging around this product. More specifically still, the majority of the machines suggested until now are designed to

receive closure profiles in longitudinal direction, that is to say parallel to the direction of forward displacement of the film. These machines with longitudinal profiles, however, present the drawback of limiting the height of the bags obtained. This height, indeed is equal to one half the circumference of the forming neck. Furthermore, the packagings obtained on these machines at times present tightness defects. This especially results from the fact that the transverse welding means are hindered in their operation by the excess-thickness generated by the longitudinal profiles.

Numerous attempts have been made to try and improve this situation, by placing the closure profiles not longitudinally, or parallel to the direction of forward displacement of the film, but transversely, or perpendicular to the direction of forward displacement of the film

The first attempt in this respect, known to inventors, is described in the documents US-A-4617683 and US-A-4655862. Th se documents that are approximately twelve years old have suggested two solutions to move the transverse profiles onto the film in its flat state, before the latter reaches the forming neck. The first solution consists in laterally displacing portions of closure profiles using small discs or wheels laterally placed along the edges of the film being moved forward, in combination with a suction-prehension head with transverse displacement. The second solution consists in depositing closure profiles onto the film using a rotary barrel equipped with temporary holding means pneumatically controlled.

The attempts thus suggested have proved promising at first. They did not, however, prove satisfactory in the end and they were abandoned by the specialists. Especially, it was observed that the means described in the aforementioned documents do not always permit to deposit the profiles onto the film in a perfectly linear state. As a result, it is many times difficult to make the complementary profiles cooperate.

Other solutions have then been suggested, to try and offset the drawbacks resulting from the means of execution described in the aforementioned documents.

It has been suggested in document US-A-4666536, for example, to wind part of the film on a mandrel and to move forward onto this wound part of the film a portion of closure profiles, oriented along the width of the film, using a heating tunnel that ensures the fixation of the profiles. The means described in this document offer the theoretical advantage of permitting a formation in continuous forward displacement. They prove to be very complex, however, and difficult to use.

In the document US-A-4701361 it has been proposed to form a film equipped in sequence with closure profiles, to execute by extrusion a tubular film equipped with helix-shaped closur profiles either extruded or attached, then to cut out the tubular tube into the shape of a helix to obtain a strip equipped with equidistributed transverse profiles.

The document US-A-4878987 has proposed--to reduce the width of the profiles placed on the film and consequently to improve their

positioning--to supply the profiles not from a lateral reserve, as described in the documents US-A-4617683 and US-A-4655862, but to use two profile reserves respectively located on each side of the film that is to form the bags or pouches. Thus, each one of the two profile portions displaced on the film, respectively from each lateral reserve, no longer covers the totality of the film width, but only one half of it.

The document US-A-4844759 has then proposed two other solutions. The first one of these solutions consists in driving the closure profiles, using an endless belt, over a stirrup superposed to the film and pivoting over 180°, to turn the closure profiles over on the above mentioned film. Thus, the profiles are initially moved forward on the stirrup with their relief directed toward the film, then they are turned over, their relief now directed opposite to the film, to be affixed to the latter. The second solution consists in transversely moving the profiles over a shoe superposed to the film, then in lowering this shoe against the film to ensure the fixation of the closure profiles.

After having observed that none of the techniques described in the aforementioned documents proves satisfactory, there has been proposed in the document US-A-5111643, a completely different way of proceeding, that consists not in fixing the closure profiles to the film prior to the forward displacement of that film on the forming neck, as described in the aforementioned documents, but first of all in shaping the film into a tube , on the forming tube (neck), then in bringing forward the closure profiles onto the

tubular film. To that end, the document US-A-5111643 proposes a complex installation comprising a chute that opens at the base of the forming n ck, to move forward the closure profiles carried by a supporting strip, and an evacuation chute for the support strip.

The present invention now has as its purpose to improve the forming machines, for film based packagings that comprise complementary closure profiles.

This purpose is achieved, according to the present invention, by the use of a machine characterized in that it comprises means for the forward displacement of the closure profiles on the film, in a transverse direction, means that comprise, in combination:

- a rectilinear guide superposed to the film, in a direction transverse to this film, designed to position with precision at least one closure profiled, transversely above the film, and
- a means for the prehension of the upstream end of the closure profile, capable of transverse displacement, along the guide, to move forward the closure profile in the latter by traction on the upstream end of the closure profile.

The invention preferably applies to the automatic forming, filling and closing machines for packagings based on film, of the type known in itself that comprises a forming neck that receives, at its intake, the film in a flat state that comes from an unwinding device and that, at its exit, supplies the film shaped

into a tube; a filling chute that opens into the forming neck and consequently into the above-mentioned tube, means to move closure profiles forward, transversely to the film, before the latter reaches the forming neck, and to fix these closure profiles onto the film; longitudinal welding means to close the tube in its longitudinal direction; and means capable of generating, in sequence, a first transverse welding before a product is introduced into the tube by the filling chute, then a second transverse welding once the product has been introduced into the tube, to close a packaging around the latter (product).

Thus, the present invention runs against the general assumptions connected with the means of execution described in the first documents US-A-4617683 and US-A-4655862. Indeed, while numerous designers have considered that the means described in these documents could not give satisfaction, a fact that has brought about the many later proposals recalled above, the present inventors have found, after much experimenting, that a solution based on the means described in these documents US-A-4617683 and US-A-4655862, could give satisfaction with the reservation of an improvement that consists in combining a rectilinear guide with a prehension means that works on the closure profiles by traction.

According to another advantageous characteristic of th invention, the means for the forward displacement of the closure means are adapted to fix on the film one of two complementary closure profiles, that are engaged, each one of them having a length of the order of one half the width of the film, and there

are further provided for means capable of fixing the second closure profile onto the internal wall of the film that has been formed into a bag or pouch, after same has been filled, at the time the bag or pouched is being finished.

In order to facilitate these operations of fixation of the closure profiles in two steps, the two profiles preferably are carried by support strips or different width.

Other characteristics, purposes and advantages of the present invention will appear upon reading of the detailed description that follows, and given in relation to the attached drawing, that is meant only as a non-limiting example and in which:

- figure 1 shows a schematic view, in perspective, of an automatic forming, filling and closing machine for bags or pouches according to the present invention.
- figures 2 and 3 schematically illustrate two variants of execution of the invention.
- figure 4 is a vertical section view of the machine, along II-II in figure 1.
- figure 5 shows a lateral view of a bag or pouch according to the present invention, and
- figure 6 shows a perspective view of a bellows-type bag according to the present invention.

There is found again in the attached figure 1 the general

classical structure of an automatic machine for forming, filling and closing bags.

- means 10 for the forward displacement of the film F,
- a forming neck 20,
- a filling chute 30,
- means 40 for longitudinal welding,
- means 50 for transverse welding and separation of the bags or pouches.

This general structure being known, it shall not be described in detail any more in the following.

As indicated above, however, according to the invention in order correctly to move forward the closure profiles P, transversely, onto the film F, before the latter reaches the forming neck 20, there are provided:

- a rectilinear guide (100) superposed to the film F, transversely to the direction of forward displacement of the latter, upstream from the forming neck 20; this guide 100 being designed to position with precision at least one closure profile P transversely over the film, and
- a means 150 for the prehension of the upstream end of the closure profile P; which prehension means 150 is capable of transverse displacement along the guide 100, to move the closure profile P into the latter by traction on the upstream end of the closure profile.

The rectilinear guide 100 may be the object of various modes of execution.

According to a first mode of execution, the guide 100 is formed of a rigid rectilinear channel the section of which is complementary of at least one part of the closure profiles P.

According to another mode of execution, the rectilinear guide 100 is made up of a channel formed of two pivoting clamping jaws that in closed position receive the profile P being moved forward by the means 150, but capable of opening in order then to deposit profiles P onto the subjacent films F.

The prehension means 150 may also be the object of different modes of execution.

As schematically shown in figure 1, attached, these prehension means preferably are formed on a pincer system governed to close so as to grasp the upstream end of a profile P in order to move same forward in the rectilinear guide 100, then governed to open, in order to release the profile P before taking back its initial prehension position schematically shown in figure 1.

According to a variant, the prehension means 150 may be constituted by a suction head.

Preferably, of course, there are provided means for the transverse displacement of the prehension means 150, synchronized on the displacement of the film F.

Auxiliary means preferably are provided for the forward displacement of the profiles P: driving small discs or wheels 200, 202, a guide 204 for the profiles upstream of film F, means 206 for

the sectioning of the profiles P into portions (the profiles P1 preferably being actuated from a wound reserve 208), and a position sensor 210.

The closure profiles P are affixed to the film F by any suitable means, advantageously so by means of welding jaws associated with the rectilinear guide 100, such as schematically shown by reference 120 in figure 1.

Various modes of execution may be provided for the depositing of the profiles P onto the film F.

According to a first variant, the system is adapted to deposit closure profiles P that cover the entire width of the film F, these profiles P being affixed to the film F over their entire length, as schematically shown in figure 3, and coming to engage only after the tubular film has been folded back on itself and pressed together, following the filling of the small bag or pouch at the time the latter is finished.

According to another variant, however, as schematically shown in figure 2, the system may be adapted for the direct depositing onto the film F of a pair of engaged profiles P, that cover only one half of the film F width, one, P1, of the two profiles adjacent to the film being affixed onto the latter at the level of the depositing station, by means of the welding jaws 120, while the second profile P2, superposed to it, is affixed to the internal wall of the bag or pouch, after same has been filled. In this case, the second profile P2 may be welded onto film F by means of the welding jaws 50, or even by means of additional transverse

welding jaws 52, as schematically shown in figure 4.

Within the framework of this second solution, preferably and as shown in figure 4, the support strip 54 of the second profile P2 is wider than the support strip 56 of the first profile P1, this in order to facilitate the second welding.

The profile P being placed transversely onto the film F before the latter reaches the forming neck, there are preferably provided means that facilitate its passage over this forming neck 20.

To that end, it is possible to provide either for a de-centering of the forming neck 20 relative to the vertical axis of the machine in order to permit passage of the transverse closure profiles P, or to provide for a sufficient play at the level of the forming neck 20.

Besides, the bags or pouches obtained may themselves be the object of numerous variants, among which there will be mentioned:

- as shown in Figure 5, the possibility of executing pre-cutting lines 80 between the closure profiles P and the second transverse welding 82 (such a pre-cutting line may be executed in a classical manner known in itself, by means of toothed knives associated with the transverse welding jaws 50).
- the possibility of executing curved-in longitudinal weldings, of the so-called "coat hanger" type, as illustrated in 85 in figure 5, especially for applications having a liquid content. Such weldings 84

have a generally rounded shape, convex toward the inside of the bag or pouch, and that converge toward the summit of same that coincides with the second transverse welding 82. In figure 5, there is illustrated in 86 the first transverse welding and in 88 the longitudinal welding executed by means of the jaws 40, to connect together the longitudinal edges of the film F. Preferably, the longitudinal weldings 84 of the "coat hanger" type are symmetrical with respect to a median plane of the bag or pouch, that is transverse relative to the weldings 82, 86 and executed by means of welding jaws of complementary shape.

the possibility of executing these small bags or pouches with lateral bellows 90, 92, as schematically shown in figure 6, thanks to the execution of longitudinal folds on the film F prior to its entry onto the forming neck 20.

In figure 4, there is schematically shown in 51 a cutting tool associated with the transverse welding jaws 50 to separate the bags once they are completed, and there is schematically shown in 53 a cutting tool capable of being used to execute the pre-cutting line 80.

The closure profiles P themselves may be the object of numerous variants.

As schematically shown in figure 2, they may be complementary

asymmetrical male/female profiles P1, P2.

They may also be, as schematically shown in figure 3, profiles P with a constant section, capable of becoming engaged after being folded back on themselves.

Preferably, there are provided means, for example in the form of bi-material profiles P or equivalent means, that make it possible to define a melting temperature on the external surface of the support strips 54, 56 that is lower than the melting temperature on their internal surfaces.

The film F used may also be the object of numerous variants. It may be a flexible film of monolayer or multilayer plastic material, possibly coated, metallized for example.

The present invention offers numerous advantages as compared to the previously existing systems, and among which it is possible to mention the following ones:

- the depositing of the closure profiles P by traction, and on a guide 100, permits a highly precise positioning over the width of the film F, and in a rectilinear state,
- a great facility of execution, and
- a good tightness (closure profiles extend parallel to the transverse welding means (50) and they do not disturb the functioning of the latter).

Of course, the present invention is not limited to the particular modes of execution just described, but it extends to all (any) variant falling within its spirit.

Thus, there has been described above the application of the invention to automatic forming,filling,and closing machines for film-based packaging.

It is also possible, however, to apply the invention to machines for the preparation of films equipped with profiles, which films equipped with profiles are then moved forward to feed automatic forming, filling and closing packaging machines that are classical per se.

There have been described above prehension means formed either of a pincer system, or of a suction head. According to another variant, the prehension means may be formed of a needle carried by driving means suitable on the one part, alternately to displace the needle, by either translation or pivoting, in order to bring it nearer to, or move away from, the guide 100, to pick the profile P in the position close to the guide, and on the other part, alternately to displace the needle in a back and forth motion along the guide 100. More precisely, these driving means are adapted: 1. to bring the needle to the upstream end of the guide 100 to pick the free end of the profile P coming from the reserve 208; 2. to displace the needle along the guide 100 while maintaining this needle in close position engaged with the profile to move the latter forward by traction on its upstream end; 3. to displace the needle in a moving-away direction from guide 100 to release profile P at the end of its moving-forward run, and 4. to displace the needle along the guide 100, in return direction, toward the upstream end of the latter while maintaining the needle

in a remote, free position relative to the profile, before repeating the driving cycle starting with step 1., for the following portion of profile P.

C l a i m s

1. A machine for the forming of packaging starting from a film (f), that comprises complementary closure profiles (P), characterized in that it has means to move the closure profiles forward on the film (F), which means have, in combination:

- a rectilinear guide (100) superposed to the film (F), transversely to said film, designed to position with precision at least one closure profile (P), transversely over the film (F), and
- a means (150) for the prehension of the upstream end of the closure profile, capable of transverse displacement, along the guide (100), to move the closure profile (P) forward into the latter by traction on the upstream end of the closure profile.

2. A machine according to claim 1, characterized in that the forming machine constitutes a automatic forming, filling, closing packaging machine, comprising a forming neck (20) that at its entrance receives, in its flat state the film coming from a de-winder, and that at its exit delivers the film (F) shaped as a tube, one filling chute (30) that opens into this forming neck (20) and consequently into said tube, means (200, 202, 204) to move forward closure profiles (P), in a transverse direction over film (F) before this film reaches the forming neck (20), and to fix these (profiles) onto the film (F), longitudinal welding means (40)

to close the tube longitudinally and means (50) capable of generating, in sequence, a first transverse welding before any product is introduced into the tube by the filling chute (30), then a second transverse welding after the product has been introduced into the tube, and then to close a packaging around the latter.

3. A machine according to claim 1, characterized in that the forming machine constitutes a film preparation machine equipped with closure profiles, which film equipped with closure profiles is then moved forward to be supplied to automatic forming, filling and closing packaging machines .

4. A machine according to claims 1 to 3, characterized in that the means for the forward displacement of the closure profiles (P) are adapted to fix onto the film (F) one (P1) of two engaged complementary profiles, each one of which has a length of the order of one half the width of the film (F), and there are further provided means (52) capable of fixing the second closure profile (P2) onto the internal wall of the film formed as a bag or pouch, after the latter has been filled, at the time the bag or pouch is finished.

5. A machine according to one of claims 1 to 4, characterized in that the two closure profiles (P1), P2) are carried by support strips (54, 56).

6. A machine according to claim 5, characterized in that the support strip (54) of the closure profile (P2) that is the second one fixed, is wider than the support strip (56) of the closure profile (P1) affixed at the level of the depositing station.

7. A machine according to one of claims 1 to 3, characterized in that the means for the forward displacement of th closure profiles (P) are adapted to fix onto the film (F) an assembly of closure profiles (P) covering the entire width of the film (F), which closure assembly comes into engagement only after the folding over and crushing of the tubular film (F) after the filling of the small bag or pouch, at the finishing of same.

8. A machine according to one of claims 1 to 7, characterized in that the rectilinear guide (100) is formed of a rigid rectilinear channel .

9. A machine according to one of claims 1 to 7, characterized in that the rectilinear guide (100) is made up of a channel formed of pivoting jaws capable of opening to facilitate the depositing of the profiles.

10. A machine according to one of claims 1 to 9, characterized in that the prehension means (150) are formed of a system of pincers governed for opening and closing.

11. A machine according to one of claims 1 to 9, characteriz d in that the prehension means (150) comprise a suction head.

12. A machine according to one of claims 1 to 9, the prehension means (150) comprise a needle associated with means adapted to displace this needle alternately in order to bring it closer to, and in order to move it away from, the rectilinear guide (100), to pick the profile (P) in close-by position on the one part, and alternately to displace the needle along the guide to move the closure profile forward by traction on its upstream end.

13. A machine according to one of claims 1 to 12, characterized in that there are provided means for the transverse displacement of the prehension means (150) synchronized by the displacement of the film (F).

14. A machine according to one of claims 1 to 13, characterized in that there are provided means (206) for the sectioning of the profiles (P) into portions.

15. A machine according to one of claims 1 to 14, characterized in that the means (120) for the fixation of the closure profiles (P) onto the film (F) are formed of welding jaws.

16. A machine according to one of claims 1 to 15, characteriz d in that it comprises means (53) adapted to execute at least one pre-cutting line (80) between the closure profiles (P) and the second transverse welding (82).

17. A machine according to one of claims 1 to 16, characterized in that it comprises means (40) suitable to execute an inward-curving longitudinal welding of the "coat-hanger" type, especially for application with a liquid content.

18. A machine according to one of claims 1 to 17, characterized in that it comprises means suitable to execute longitudinal folds on the film (F) before the latter enters the forming neck (20), to form bags or pouches with lateral bellows (90, 92).

19. A machine according to claims 1 to 18, characterized in that it comprises means capable of moving forward complementary asymmetrical male/female closure profiles (P).

20. A machine according to one of claims 1 to 18, characterized in that it comprises means (208) capable of moving forward a profile (P) with a constant section, capable of coming into engagement after folding over on itself.

21. A machine according to one of claims 1 to 20, charact rized in that the profiles (P) are adapted to define a melting temperature, on the external surface of their support strips (54, 56), that is lower than the melting temperature on the internal surface of same.

22. Packaging obtained through the execution of a machine according to one of claims 1 to 21.